REMARKS

This amendment is filed concurrently with a Request for Continued Examination. Claims 1-3, 5-9 and 36-39 are pending in the present application. Claims 1, 37 and 39 have been amended. Claim 4 has been cancelled. New claims 40-26 have been added.

In response to Applicants' Response After Final, the Examiner has withdrawn the § 112, ¶1 and ¶2 rejections. Applicants respectfully request reconsideration of the remaining rejections of the pending claims in light of the foregoing amendments and the following arguments.

Claims Rejection under 35 U.S.C. § 103

The Final Office Action rejects claims 1 and 4-6 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,763,043 to Porter et al. This ground of rejection is respectfully traversed.

Claim 1 has been amended to recite "a reinforcement for cementitious boards comprising an open mesh of high modulus of elasticity fiber strands covered by an alkali-resistant thermoplastic material, wherein said alkali-resistant thermoplastic material is coextruded with said strands to provide a substantially continuous coating of said alkali-resistant thermoplastic material about said strands, and wherein said alkali-resistant thermoplastic material is selected from the group consisting of polyolefins and olefin copolymers. Porter et al. do not teach or suggest a thermoplastic material coating which is coextruded with the fiber strands, nor does Porter et al. teach or suggest that the thermoplastic material is a polyolefin or olefin copolymer. An "olefin" is defined as one of the group of unsaturated hydrocarbons of the general formula C_nH_{2n}, named after the corresponding paraffins by the addition of "ene" or "ylene" to the root, for example, ethylene, propylene, and pentene. A "copolymer" is a long-chain molecule formed by the reaction of two or more dissimilar monomers. Rather, Porter et al. teaches an open mesh which is coated after the formation of the mesh with a thermoplastic material which may be polyvinyl chloride, polyvinylidene chloride, styrene butadiene rubber, urethane, silicone, acrylic or styrene acrylate polymers or copolymers. The coating materials disclosed by Porter et al. are

typical coatings for fiber mesh formation due to their relatively low cost and their relatively soft, flexible properties. Unlike these listed materials, polyolefins are relatively stiffer, which would not be considered a beneficial characteristic in forming the fiber mesh of Porter et al. Thus, one of ordinary skill in the art would not be motivated to replace the thermoplastic coating materials of Porter et al. with the polyolefin or olefin copolymers as required by amended claim 1 as one would not have expected polyolefins or olefin copolymers to be effective in Porter et al.'s application. In addition, it would not be obvious to co-extrude a thermoplastic coating material with the fiber strands, as required by amended claim 1, due the increased cost of co-extrusion over dip-coating after mesh formation.

Still further, as stated in Applicants' last response, Porter et al. also do not disclose that the strands have a "substantially continuous coating" as required by claim 1. Since the resinous coating of Porter et al. is applied after the fabric is made, there will necessarily be several areas along the strands (where the warp and weft strands intersect) that are not coated by the resin. Therefore, for these reasons, claim 1 should be allowable over this reference. As claims 5-6 depend from claim 1, they should be allowable for the same reasons.

The Final Office Action further rejects claims 1-5, 7 and 39 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,054,205 to Newman et al. Newman et al. disclose a glass fiber facing sheet for cement boards including an open mesh glass scrim and a melt blown polymer web. The scrim is formed by a plurality of intersecting glass yarns which are bonded at their cross-over points with a polymeric binder. Similar to those disclosed in Porter et al., supra, the polymeric binder, or coating, of Newman et al. may include polyvinyl chloride, polyvinyl acetate, polyvinylidene chloride, polyvinyl alcohol, styrene butadiene rubber, urethane, silicone, metallic resinates, wax, asphalt, acrylic resins, styrene acrylate copolymers, aromatic isocyanates and diisocyanates, organohydrogenpolysiloxenes, thermoset resins such as epoxies and phenolics, or mixtures thereof. Newman et al. do not teach or suggest that the thermoplastic material is a polyolefin or olefin copolymer, nor that such thermoplastic material is co-extruded with the fiber strands. As stated above, one of ordinary skill in the art would not be motivated to replace the coating materials disclosed in Newman et al. which are typically softer and more

pliant, with the polyolefins or olefin copolymers as required by amended claim 1, due to the known stiffness properties of the latter materials.

Again, as stated in Applicants' last response, just as with the Porter el al. reference, Newman et al. also do not disclose that the strands have a "substantially continuous coating" as required by claim 1. Since the polymer coating of Newman et al. is applied after the grid is made (by passing the grid through a resinous bath), there will necessarily be several areas along the strands (where the warp and weft strands intersect) that are not coated by the polymer. Therefore, claim 1 should be allowable over this reference. As claims 2, 5, 7 and 39 depend from claim 1, they should be allowable for the same reason.

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Newman et al. in view of Porter et al. As claim 6 depends from claim 1, it should be allowable for the same reasons as set forth above with respect to claim 1, which as stated above, is patentable over both Newman et al. and Porter et al.

The Final Office Action further rejects claims 3 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Newman et al. in view of U.S. Patent No. 6,171,984 to Paulson et al. In the Advisory Action dated May 9, 2003, the Examiner responded to Applicants' arguments with respect to claim 1 in stating that "[t]his argument is not persuasive because . . . one would have been motivated to coat the mesh prior to formation to protect the underlying substrate". However, the Examiner failed to respond to any of Applicants' arguments with respect to independent claim 8.

Claim 8 recites a "reinforcement for cementitious boards comprising an open mesh of high modulus of elasticity fiber strands covered by alkali-resistant thermoplastic material, wherein said thermoplastic material is initially fibrous, <u>and wherein at least a portion of the fibrous thermoplastic material is fused or sintered such that said portion of the fibrous thermoplastic material is merged into a continuous mass which substantially encapsulates a respective high modulus of elasticity fiber strand</u>."

As conceded by the Examiner, Newman et al. do not disclose that the thermoplastic material is fibrous at any point. Paulson et al. disclose a geosynthetic material for earth

reinforcement including a first and second plurality of parallel strands which intersect each other. The strands may be comprised of a combination of polymeric and inorganic fibers, and either may form a core material surrounded by the other. However, Paulson et al. do not teach or suggest that the polymeric fibers, or any portion thereof, may be fused or sintered such that such portion of fibers is merged into a continuous mass which encapsulates the other fibers. Rather Paulson et al. teach that a base coating is applied to impregnate the fibers of the strand to provide cohesion and that a bonding agent is applied to adhere predetermined regions of the selected weft fibers with selected warp fibers. In the Final Office Action, the Examiner states that "it would have been obvious to one having ordinary skill in the art to have used Paulson's teaching of glass strands forming core with polymeric strands disposed about the core materials on the glass fiber facing sheet of Newman et al. having a thermoplastic binder coated upon it, motivated by the desire to obtain a glass fiber facing sheet with improved resistance to chemical degradation." The Examiner has failed to respond to the above argument (which was also present in Applicants' previous responses of April 25, 2003 and December 2, 2002), which relates to the absence of any teaching suggestion in either reference of the polymeric fibers being fused or sintered to merge a portion of the fibers into a continuous mass. Applicants respectfully request that the Examiner allow these claims in the absence of any teaching or suggestion in Paulson et al. for a polymeric coating which is merged into a continuous mass which encapsulates the remaining fibers. For the above reasons, claim 8 should be allowable over the cited references. As claims 3, and 36-37 depend from claim 8, they should be allowable for the same reasons.

The Final Office Action further rejects claim 9, which depends from claim 3, under 35 U.S.C. § 103(a) as being unpatentable over Newman et al. and Paulson et al., and further in view of U.S. Patent No. 4,967,548 to Fangeat et al. or U.S. Patent No. 6,335,087 to Hourahane. However, as stated in previous responses, both Fangeat et al. and Hourahane fail to correct the deficiencies of Newman et al. or Paulson et al. with respect to teaching or suggesting that a thermoplastic fibrous material, or any portion thereof, may be fused or sintered such that such a portion of fibers is merged into a continuous mass which encapsulates the other fibers. Applicants respectfully request that the Examiner address this argument or allow these claims.

Fangeat et al. relates to textile yarns and discloses a fire-resistant yarn comprising an inorganic filament core surrounded by fibers formed at least in part from aramid resin. There is no suggestion whatsoever of fusing or sintering these fibers to encapsulate the core, as this would be counter to the purpose of the aramid fibers, which, at least in part, is to deteriorate rather than melt at elevated temperatures (column 1, lines 13-17). Therefore, claim 9 should be allowable over this combination of references.

Hourahane discloses a yarn used in cement matrices which includes a core and a multitude of staple fibers forming a layer which envelopes the core. The staple fibers serve the purpose of providing a means for the cement matrix to grip the core strands, not for providing a continuous mass which encapsulates the core, as required by at least a portion of the fibrous thermoplastic material of claim 8. Further, Hourahane teaches away from such a limitation by teaching that the interstices between the staple fibers provide a void space which can be infiltrated by the cement matrix, which as the matrix crystallizes envelopes the staple fibers, thus forming a composite interface between the core and the cement matrix (column 2, lines 12-21). If such staple fibers were fused or sintered they would be ineffective to facilitate the purpose for which they are employed in the invention of Hourahane. Therefore, claim 9 should be allowable over this combination of references.

Finally claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Newman et al. in view of U.S. Patent No. 5,451,355 to Boissonnat et al. As Applicants pointed out in their response of April 25, 2003, claim 10 was cancelled in Applicants' response of December 2, 2002. Claim 38, as explained in Applicants' December 2nd response, includes the limitations of previously cancelled claim 10, which was revised for clarity, and recites that the thermoplastic material is applied via cross head extrusion to said strands.

As conceded by the Examiner, Newman et al. does not teach that the thermoplastic material is applied via extrusion to the strands to provide a continuous coating about the strands. Boissonnat et al. discloses a process for manufacturing a thread which is coated with a thermoplastic organic material using an extruder head which is supplied with the thermoplastic material. However, there is no suggestion whatsoever in either reference to use the extrusion

method of Boissonnat's for the glass fiber facing sheet of Newman. First of all, the combination of reinforcing threads and thermoplastic materials used in Boissonnat et al. are for forming composite products, the combination being the product itself, rather than a relatively minor portion of an end product, such as is the case for the coated open mesh of the present application which is used, for example, as a reinforcement for cementitious boards. Further, it would not be obvious to use the extrusion method of Boissonnat et al. in Newman, as the method of Boissonnat et al. is much more expensive than the typical dip coating used for impregnating reinforcing fabrics in cementitious matrices.

The Examiner states that it would have been obvious "to have used Boissonnat's extrusion method on Newman's coated glass scrim, motivated by the desire to obtain a glass scrim that is completely coated by the polymeric binder". In making this broad statement, the Examiner is believed to be engaging in impermissible hindsight. More particularly,

> A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, <u>guided only by the prior art references</u> and the <u>then accepted</u> wisdom in the field. ... Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one to fall victim to the insidious effect of a hindsight syndrome <u>wherein that which only the invention taught</u> is used against its teacher. *In re Kotzab*, 217 F.3d 1365. (emphasis added).

When confronted with the problem of enhancing the chemical integrity of fiber strands, one of ordinary skill in the art, looking at the primary reference, would not be motivated to go to the secondary reference. This is because Newman et al. and Boissonnat et al. involve completely different concerns, Newman et al. deal with problems of pitting or indentations due to large openings in the fabric mesh used in cement boards, and Boissonnat et al. deal with problems in the production of composite products, specifically the shearing of coating material in the process of co-extrusion. Hence, absent the use of Applicant's disclosure as a blueprint, there would be no suggestion to combine these two references. Therefore, for the reasons given above, claim 38 should be allowable over the combination of Newman et al. and Boissonnat et al.

With respect to the Examiner's comment that "[w]ith regard to claim 38, the method of forming an article is not germane to the issue of patentability of the article itself", Applicants' direct the Examiner to *Vanguard Products Corp. v. Parker Hannifin Corp.*, 234 F.3d 1370, 1373 (Fed. Cir. 2000) ("In Southwall the claims required a 'sputter-deposited dielectric', thereby including the sputter-deposit method as an explicit limitation in the invention as it was claimed."), which clearly indicates that method limitations are proper and acceptable in product claims.

In view of the foregoing remarks and amendments, Applicants submit that this application is in condition for allowance at an early date, which action is earnestly solicited.

The Assistant Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to deposit account **04-1769**.

Respectfully submitted,

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Version of Claim with Markings to Show Changes Made:

In the Claims:

1. (Twice Amended) A reinforcement for cementitious boards comprising an open mesh of high modulus of elasticity fiber strands covered by an alkali-resistant thermoplastic material, wherein [prior to formation of the open mesh] said alkali-resistant thermoplastic material is [applied to] <u>co-extruded with</u> said strands to provide a substantially continuous coating of said alkali-resistant thermoplastic material about said strands<u>, and wherein said alkali-resistant thermoplastic material is selected from the group consisting of polyolefins and olefin copolymers</u>.

2. (Unchanged) The reinforcement of claim 1 wherein said mesh is heated after formation thereof to fuse said thermoplastic material to allow bonding at areas where said strands intersect.

3. (Unchanged) The reinforcement of claim 8 wherein said mesh is heated after formation thereof to fuse or sinter said portion of the fibrous thermoplastic material to form said substantially continuous mass.

Please cancel claim 4.

5. (Unchanged) The reinforcement of claim 1 wherein said mesh has a strand count of about 2 to about 18 strands per inch in each direction.

6. (Unchanged) The reinforcement of claim 1 wherein said strands comprise bundled glass fibers having a linear density of about 33 to about 300 tex.

7. (Unchanged) The reinforcement of claim 1 wherein said mesh is no greater than about 0.020 inch in thickness.

8. (Unchanged) A reinforcement for cementitious boards comprising an open mesh of high modulus of elasticity fiber strands covered by alkali-resistant thermoplastic material, wherein said thermoplastic material initially is fibrous, and wherein at least a portion of the fibrous thermoplastic material is fused or sintered such that the portion of the fibrous thermoplastic material is merged into a substantially continuous mass which substantially encapsulates a respective high modulus of elasticity fiber strand.

9. (Unchanged) The reinforcement of claim 8 wherein said fibrous thermoplastic material is friction spun as a fibrous sheath on a core comprised of said high modulus of elasticity strand.

36. (Unchanged) The reinforcement of claim 8, wherein the high modulus of elasticity fiber strands comprised E-glass, and wherein the fibrous thermoplastic material comprises a core sliver of thermoplastic fibers commingled with the high modulus of elasticity fiber strands, and a plurality of sheath thermoplastic fibers which cover the core sliver thermoplastic fibers and high modulus of elasticity fiber strands.

37. (Twice Amended) The reinforcement of claim 36, wherein the core sliver of thermoplastic fibers comprise one or more of isotactic or syndiotactic polypropylene, ethylene-propylene copolymers or other olefinic fibers, nylon, polyvinyl chloride, or polyester, and wherein the sheath fibers comprise one or more of polypropylene, polyethylene, copolymers of polybutylene and propylene, ethylene propylene rubber, thermoplastic polyolefin rubber, [polyvinylidene chloride,] and ethylene-propylene diene monomer.

38. (Unchanged) The reinforcement of claim 1, wherein said alkali-resistant thermoplastic material is applied via cross head extrusion to said strands.

39. (Twice Amended) The reinforcement of claim [4] 1 wherein said olefin copolymers include ethylene propylene rubber, thermoplastic polyolefin rubber, ethylene-propylene diene monomer or copolymers of polybutylene and propylene.

Please add the following new claims:

40. (New) A method of making a reinforcement for cementitious boards comprising:

(a) co-extruding high modulus of elasticity fiber strands with an alkali-resistant thermoplastic material to provide a substantially continuous coating of said alkali-resistant thermoplastic material about said strands, wherein said thermoplastic material is selected from the group consisting of polyolefins and olefin copolymers; and

(b) forming an open mesh of said coated high modulus of elasticity fiber strands.

41. (New) The method of claim 40, further including heating said mesh after formation thereof to fuse said thermoplastic material at areas where said strands intersect.

42. (New) The method of claim 40, further including embedding said open mesh in a cementitious matrix to form a reinforced cementitious board.

43. (New) A method of making a reinforcement for cementitious boards comprising:

(a) providing strands of alkali-resistant thermoplastic material about high modulus of elasticity fiber strands;

(b) forming a mesh from said strands of thermoplastic material and high modulus of elasticity fiber strands; and

(c) fusing or sintering said stands of alkali-resistant thermoplastic material to merge said thermoplastic material strands into a substantially continuous mass which substantially encapsulates said high modulus of elasticity fiber strands.

44. (New) The method of claim 43, wherein said strands of thermoplastic material are friction spun as a fibrous sheath on a core comprised of said high modulus of elasticity strands.

45. (New) The method of claim 43, wherein said strands of thermoplastic material comprise a core sliver of thermoplastic fibers commingled with said high modulus of elasticity fiber strands, and a plurality of sheath thermoplastic fibers which cover the core sliver of thermoplastic fibers and high modulus of elasticity strands.

46. (New) The method of claim 43, wherein said core sliver of thermoplastic fibers comprise one or more of isotactic or syndiotactic polypropylene, ethylene-propylene copolymers or other olefinic fibers, nylon, polyvinyl chloride or polyester, and wherein said sheath fibers are comprised of one or more of polypropylene, polyethylene, copolymers of polybutylene and propylene, ethylene propylene rubber, thermoplastic polyolefin rubber and ethylene-propylene diene monomer.